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XXII. *Sketches and Descriptions of three simple Instruments for drawing Architecture and Machinery in Perspective.* By Mr. James Peacock; *communicated by* Robert Mylne, *Esq. F.R.S.*

Read March 17, 1785.

SOME of the following machines must be placed upon the front edge of the table upon which they are to stand.

The sights may be supported by a three-legged staff.

The stocks of the squares or indexes may have steel springs upon their edges, in order to keep them in any assigned part of the grooves in which they are to slide.

FIG. I. (TAB. XIII.)

ABCD a drawing board, to be fixed on a table or stand, &c. in a vertical position. AB a sliding-piece for the top of the T square, having a rebate therein to form a groove, as expressed by the dotted line. CD, sliding-piece for the bottom of the square, having a rebate therein to form a groove for the reception of the stock as described by the dotted line; this sliding-piece to be of sufficient length to receive and support the said stock when the blade of the square is coincident with the lines KNFH or LNGI. E a hole to receive the arm or slider of the sight-piece, to be constructed in the usual manner. FGHI an opening forming the field of view for the prototype. KLMN a sheet of paper fixed on the upper part of the board for the copy, the four inner lines whereof form and inclose a space of the

the same dimensions as the field of view respectively. OP a steel sliding-piece, equal in length to the distance KF or IN; at the lower end P is a steel arm terminating in a point; and at the upper end, at O, is a similar arm, terminating with a brass button, in the center of which is a sharp steel pricker; the said pricker and the point P are to be equi-distant from the edge of the blade of the square: this arm O is to have the faculty of a spring, in order that the pricker may clear itself of the surface of the paper as soon as the finger quits the button, in the same manner as is usual in the apparatus of large protractors. This sliding steel-piece may be drawn out of the dove-tailed or rebated groove at pleasure, and the T square will then be fit for ordinary uses.

To use the Instrument.

Having fixed the board truly level and perpendicular, and placed the point of sight, or hole for vision, at such a height and distance as shall be productive of the best effect, move the square with one hand, and the steel slider with the other, until the point P coincides with the eye and any point or angle in the original object. Press the pricker at O, and the puncture will be the true place, or copy, of such original point or angle, &c.

N. B. All perpendicular lines may be drawn at once (in pencil), by bringing the left-hand edge of the square to coincide with the original line and the eye; and their lengths may be very nearly determined by the graduated edge of the square, so as to prevent confusion from unnecessary lengths of lines. The said graduated edge will also give the points in all curved or irregular objects.

FIG. II. (TAB. XIV.)

As the instrument, fig. 1. proceeds chiefly by finding the positions of Points, this is contrived to find the positions of Lines, and to determine their limits by their reciprocal intersections.

ABOCDE is a compound board, to be placed in a vertical position. FGHI is the opening, or field of view. KLMN is a loose board, upon which paper is to be fixed; and the edges of the said board are to be rebated, as described in the plan at *zz*. XYMN and OPQR are grooved recesses, to receive the said loose board, as occasion may require. STUW is a moveable parallelogram, composed of a rebated stock SU, two like graduated rulers ST and UW, and the regulating piece TW; the whole connected with screws, so as to move freely with a small force; and the distances between the centers of motion SU or TW to be equal to KF or HQ. AE and ED are rebated grooves, in which the stock of the parallelogram is to move.

To use the Instrument.

Having fixed the compound board ABOCDE truly vertical, flip the papered board KLMN into the recess XYMN, or OPQR, as the subject to be drawn may render first necessary, and slide the stock SU of the parallelogram into the groove AE, or ED, to correspond therewith; then, by moving the stock in the groove with one hand, and at the same time regulating the parallelogram with the other, the top edge of the ruler UW may be brought to coincide with any line in the original object, and the figured divisions on the edge of the ruler will at the same time determine the limits thereof, near enough to avoid a confusion of unnecessary lengths of line, &c. The true representation

sentation of the place and position of the line may be then drawn upon the paper, by the top edge of the ruler ST, a trifle longer at each extremity than it appears to be. This operation may be repeated for as many lines as can be obtained in the first position of the papered board and parallelogram; when they must be shifted into the other recess and groove, to find the rest, which may be now done without taking any further notice of the divisions on the rulers.

N. B. A common T square, applied to a board of this kind, will answer most purposes. For example: place the stock of such a square in one of the grooves, having a blade not less than the length HK or HR; mark the spaces HI and QR upon the upper edge thereof, and divide each of them into any convenient number of equal parts, and figure the said parts in the usual manner, to correspond with each other, as may be seen in fig. 1. Now, suppose the stock of the square to be in ED, it is plain, that all perpendicular lines may be drawn upon the paper KLMN in their proper places, and (by means of the divisions on the edge of the square) nearly of (though properly a trifle more than) their true length. All the lines of this description being obtained, the shifting board must be placed in its other recess, and the stock of the square into the other groove; then, beginning with the first line, bring the edge of the square to agree with its limits, and mark them off upon the line on the paper, and so of all the rest in succession; and join the points, where necessary, with a common ruler.

FIG. III. (T A B. XIV.)

This apparatus is contrived to avoid the trouble of continually working against a board in a vertical position. In order

to this, two square boards are to be provided, equal in size, and of similar construction; one is to be fixed in a vertical position, for viewing the original object through a proper aperture; and the other is to be laid flat upon a desk or table, for the greater ease and conveniency of drawing the copy upon paper to be fixed thereon for that purpose.

ABCD is the vertical board; EFGH the opening therein, forming the field of view; IKL the T square, the blade thereof PL being moveable about the center P, with a moderate degree of stiffness; the stock K is to slide in a rebated or dove-tail groove AD, and be fixable to any part thereof by the screw O; the steel points MN are to move with moderate ease in a rebated or dove-tail brass groove in the middle of the blade of the square; upon the back of the groove AD are to be fixed two brass pins QQ, to rest in proper holes, similar to the holes marked RR; and the same kind of holes are to be made in the corner of the board whereon the copy is to be made.

To use the Machine.

Having placed the board ABCD in a truly vertical position, fix the shifting groove AD in the rebate, on the most convenient side of the board, by means of entering the pins Q into the holes R; then loosen the screw O, and move the stock IK, and at the same time turn the blade PL upon its center P, until one of its edges shall be coincident with some original line; then fix the stock by turning the screw O; move the points M and N, till they exactly include the apparent length of the said line; then take off the shifting groove AD, together with the T square or bevil fixed thereto, and apply the same to
the

Fig. 1.

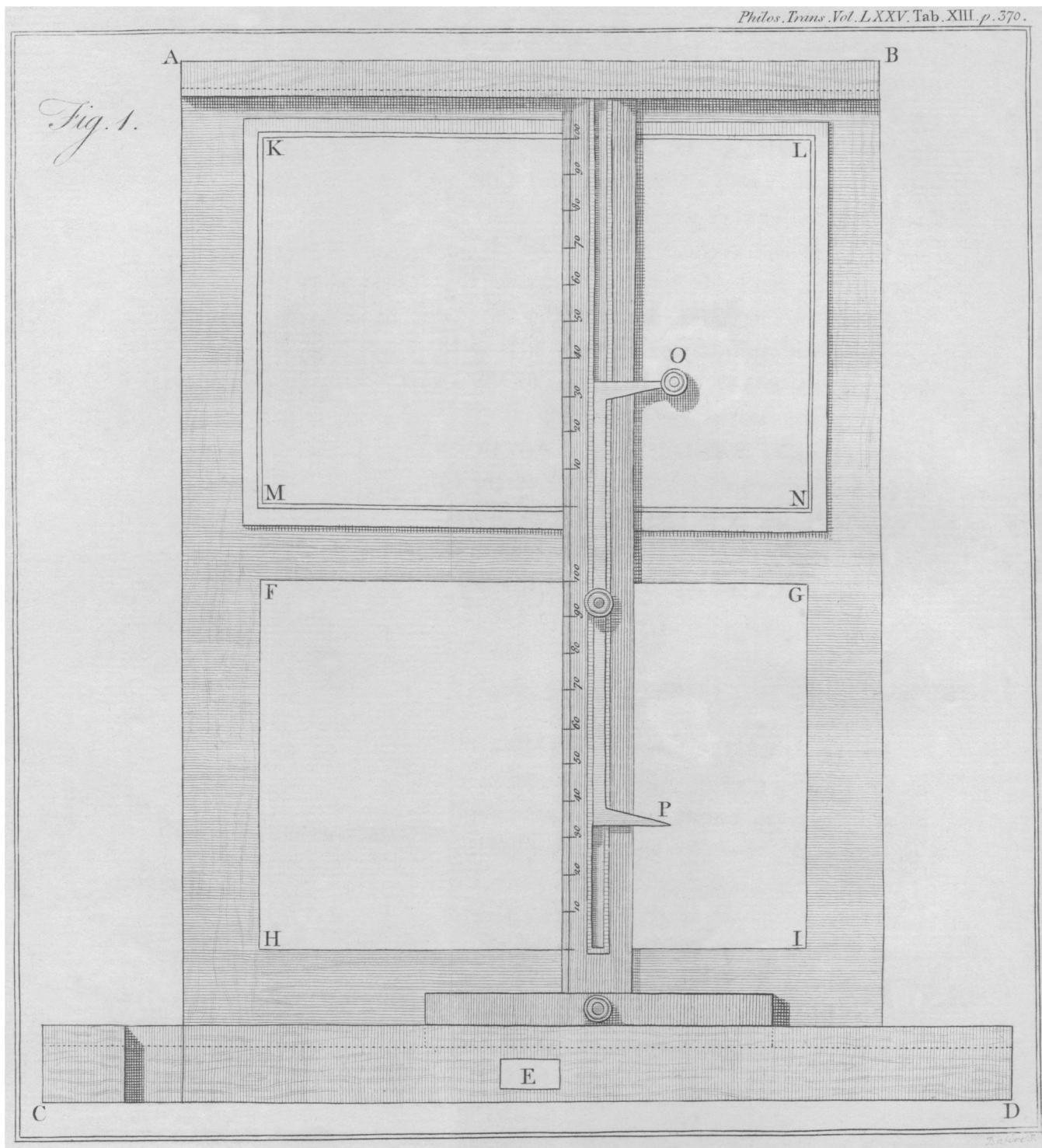


Fig. 2.

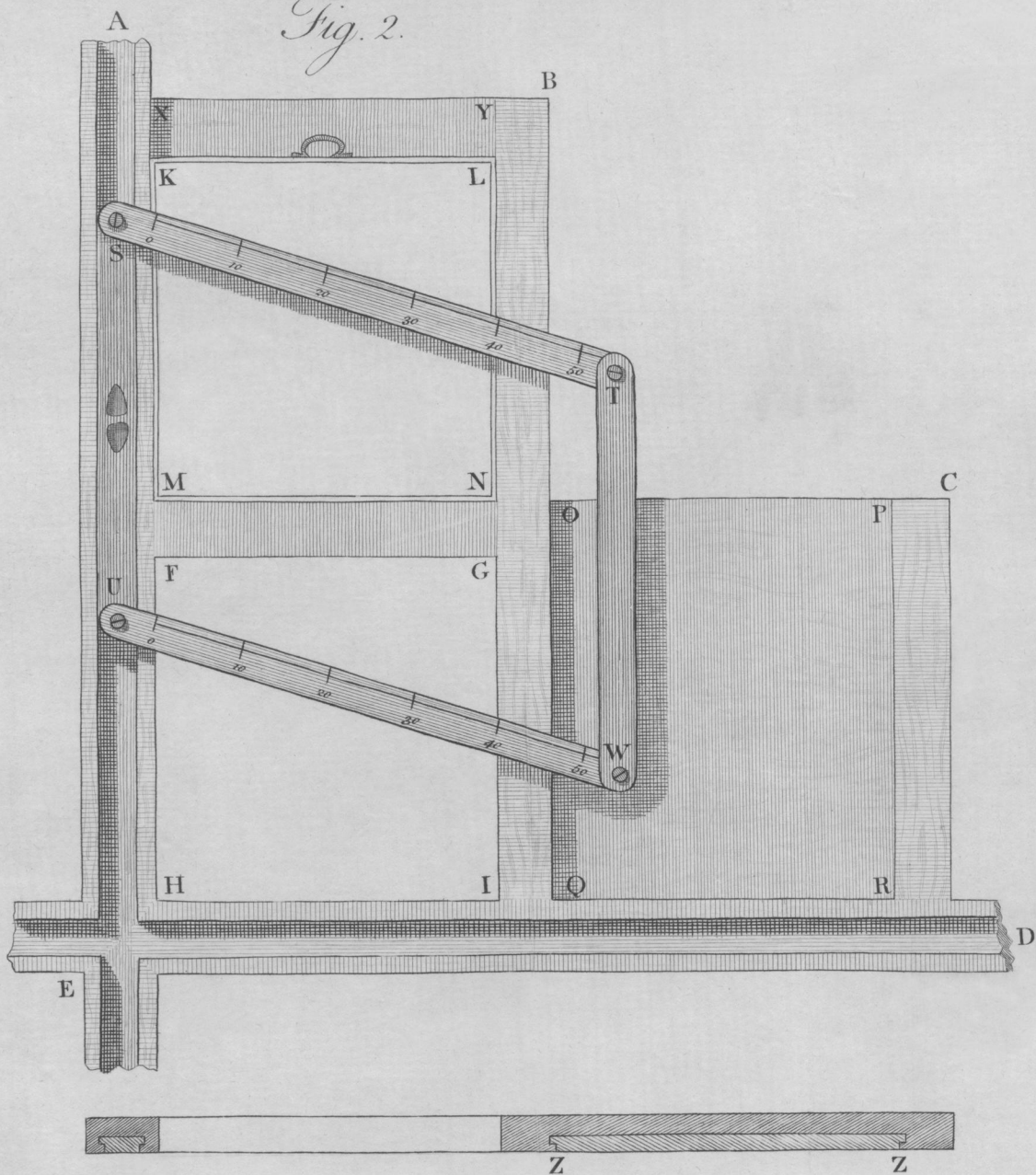
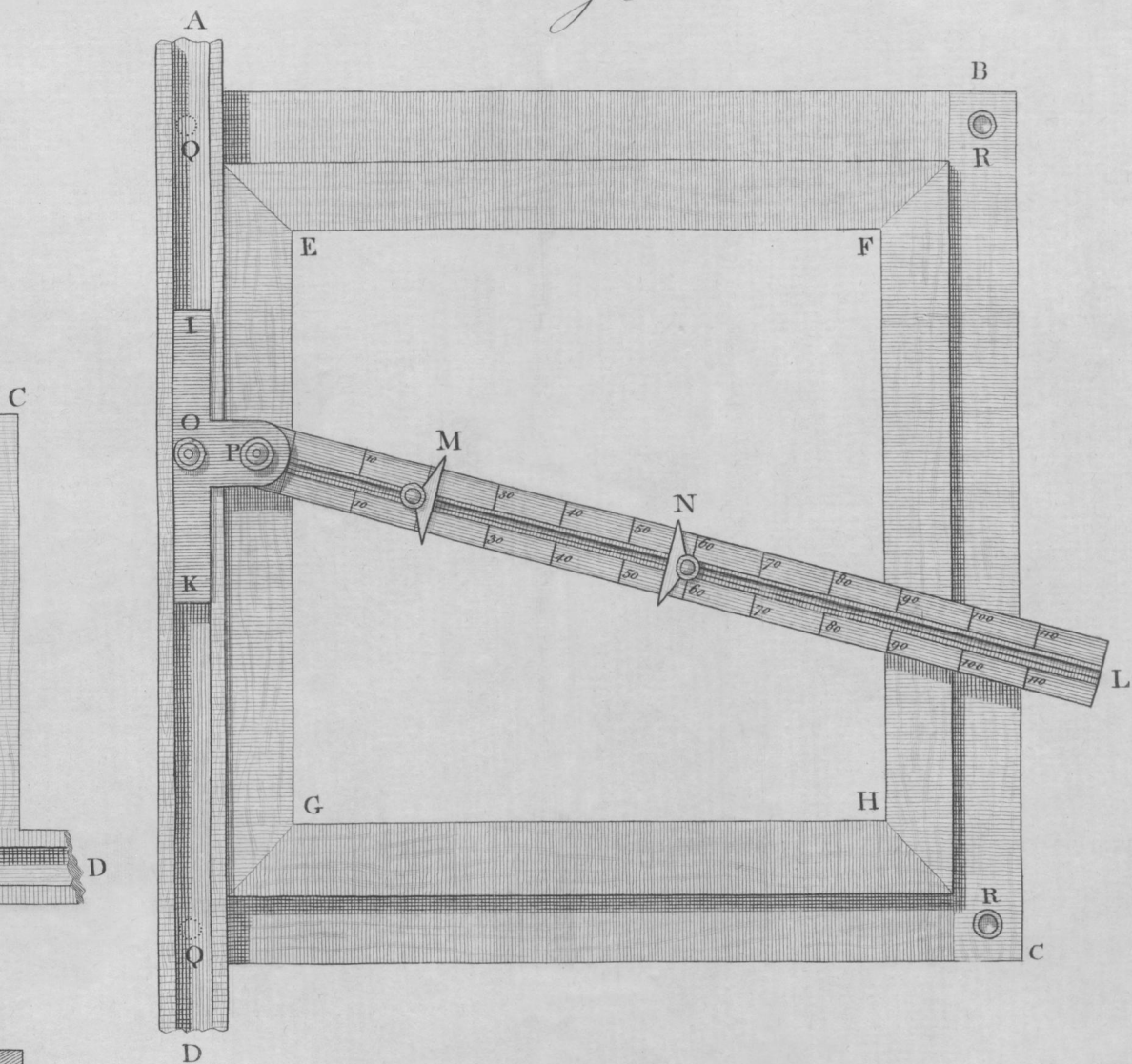


Fig. 3.



the corresponding side of the board on your desk or table, and draw the line of its precise length and position.

N. B. If this is thought too operose, the brass groove and sliding pieces M, N, may be rejected, and the blade of the square may be graduated on one or both of its edges at pleasure; and all lines in the same direction may be drawn thereby exactly as to their positions, and nearly, though somewhat exceeding, their lengths*; and their precise lengths may be determined at the same time the lines in the contrary positions are drawn, whose lengths will be given at the same time by the lines first drawn.

* This will be effected, by noticing the numbers upon the blade, and taking those next beyond the apparent limits of the line; and by this means the drawing will advance without the least confusion.

